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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of: Corleto  
Serial No.: 10/703,977  
Confirmation No.: 2841  
Filed: November 7, 2003  
For: Heat Treated Devolatilizer Nozzle

§ Atty. Dkt. No.: COS-928  
§  
§ Group Art Unit: 3726  
§  
§ Cust. No.: 25264  
§  
§ Examiner: Afzali  
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Mail Stop Appeal Brief-Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

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TRANSMITTAL LETTER AND FEE AUTHORIZATION

In connection with the above identified application, Applicants respectfully submit the following documents:

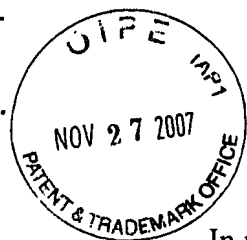
1. Appeal Brief.

The Commissioner is authorized to charge the fee of \$510.00, along with any additional fees that may be required for this submission, or credit any overpayments, to Deposit Account No. 03-3345.

Respectfully submitted,

[Signature]

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**CERTIFICATE OF MAILING**

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**APPEAL BRIEF**

Appellants submit this Appeal Brief to the Board of Patent Appeals and Interferences on appeal from the decision of the Examiner of Group Art Unit 3726 dated September 4, 2007, finally rejecting claims 1-51.

**Real Party in Interest**

The present application has been assigned to Fina Technology Inc., P.O. Box 674412, Houston, Texas 77267.

**Related Appeals and Interferences**

Appellants assert that no other appeals, interferences or judicial proceedings are known to the Appellants, the Appellants' legal representative or Assignee that will

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directly affect, be directly affected by or have a bearing on the Board's decision in the pending appeal.

### **Status of Claims**

Claims 1-51 are pending in the application and were originally presented in the application. Claims 52-53 were originally presented in the application and were withdrawn in response to a restriction requirement. Claims 1-3, 26-28 and 50-51 stand rejected under 35 U.S.C. §102(b) and claims 1-51 stand rejected under 35 U.S.C. §103(a). The rejection of the pending claims is appealed. The pending claims are shown in the attached Appendix A.

### **Status of Amendments**

No amendments have been made to the pending claims in response to the Final Office Action.

### **Summary of Claimed Subject Matter**

The reduction of volatile components (*e.g.*, monomer and volatiles) in polymer resins is desirable. *See*, page 1, lines 13-14 (paragraph 5). Independent claim 1 recites a method comprising perforating a steel plate, forming a devolatilizer nozzle from said steel plate, heat treating said devolatilizer nozzle and passing a volatile component through the perforations in the devolatilizer nozzle. *See*, specification, at least page 2, lines 21-23 (paragraph 9).

While smaller perforations generally increase the rate of devolatilization through the devolatilizer nozzle (which are thereby desirable), smaller perforations detrimentally have resulted in significant pressure increase at such points, thereby requiring that the nozzle be formed from high strength materials. *See*, specification, at least page 2, lines 5-16 (paragraphs 6-7). Unfortunately, high strength materials generally possess lower ductility and greater hardness, making accurate perforation and forming more difficult, if not unfeasible. *See, Id.* In addition, the hardness of the high strength materials makes them more susceptible to brittle failure. *See, Id.* However, the heat treatment of the present invention provides the ability to use a lower strength material (*i.e.*, steel) for ease

in perforation while providing for the strength required by small perforations that enhance devolatilization. *See*, specification at least page 4, line 23 to page 5, line 15 (paragraph 19). Therefore, dependent claim 3 recites that said heat treating increases the tensile strength of said devolatilizer nozzle.

Dependent claims 10-12 recite perforations comprising holes of no more than about 0.01 inches in diameter, no more than about 0.03 inches in diameter and no more than about 0.05 inches in diameter, respectively. *See*, specification at least page 6, lines 8-17 (paragraph 21).

Dependent claim 22 recites that the method further comprises annealing said steel plate prior to forming a devolatilizer nozzle. *See*, specification at least page 8, lines 4-5 (paragraph 24).

Independent claim 28 recites a devolatilizer nozzle comprising a heat treated and perforated steel plate. *See*, specification at least page 3, lines 8-10 (paragraph 10).

### **Grounds of Rejection to be Reviewed on Appeal**

1. The rejection of claims 1-3, 26-28 and 50-51 under 35 U.S.C. §102(b) as being anticipated by Japanese Patent No. 64-47878 ('878).
2. The rejection of claims 4-15, 19-21, 23-25, 29-40 and 44-49 under 35 U.S.C. §103(a) as being unpatentable over '878.
3. The rejection of claim 22 under 35 U.S.C. §103(a) as being unpatentable over '878 in view of U.S. Patent No. 6,007,761 (*Nakagawa*).
4. The rejection of claims 1-21 and 23-51 under 35 U.S.C. §103(a) as being unpatentable over Applicant's Admitted Prior art (*APA*) in view of '878.
5. The rejection of claim 22 under 35 U.S.C. §103(a) as being unpatentable over Applicant's Admitted Prior art (*APA*) in view of '878 and *Nakagawa*.

### **Arguments**

#### **I. THE EXAMINER ERRED IN REJECTING CLAIMS 1-3, 26-28 AND 50-51 UNDER 35 U.S.C. §102(b) AS BEING ANTICIPATED BY '878.**

Claims 1-3, 26-28 and 50-51 stand rejected under 35 U.S.C. §102(b) as being anticipated by Japanese Patent No. 64-47878 ('878). Applicants submit that '878 does

not teach, show or suggest forming a devolatilizer nozzle, as recited in the pending claims. The Examiner states that “[i]n as much structure claimed, the nozzle of ‘878 is considered a ‘devolatilizer nozzle’”. *See*, Final Office Action at page 3, lines 1-3. Appellants disagree. The pending claims recite forming a devolatilizer nozzle from a perforated steel plate.

The “forming a devolatilizer nozzle” is well known to one skilled in the art and further exemplified by the specification. For example, paragraph 24 of the specification states that “[t]he devolatilizer nozzle provided herein is formed from a steel plate” (*i.e.*, additional forming processes are required to form the steel plate into a devolatilizer nozzle). The additional forming processes may include rolling the steel plate into the shape of a nozzle. *See*, specification at least paragraphs 7, 18 and 24.

There is no teaching or suggestion in the ‘878 reference to form the plate into a devolatilizer nozzle or to pass a volatile component through the perforations in the devolatilizer nozzle, as recited in independent claim 1. Rather, ‘878 teaches a nozzle for spinning synthetic fibers, wherein a plurality of nozzle openings are installed in a stainless steel plate containing titanium. *See*, claim 1. The Examiner states that “‘878 teaches that a volatile component (reaction gas in the CVD device...) and highly corrosive solution...pass through the perforations in the nozzle” as teaching of a devolatilizer nozzle. *See*, Final Office Action at page 3, lines 3-5. However, as argued above, the devolatilizer nozzle as claimed has a structure that varies from the plate taught by ‘878 (*i.e.*, the plate of ‘878 is not formed into a devolatilizer nozzle).

Additionally, ‘878 does not teach, show or suggest heat treatment of the devolatilizer nozzle to increase the strength thereof, as recited in dependent claim 3. Rather ‘878 teaches that at least the inside peripheral surfaces of the nozzle openings are heat treated to precipitate TiC and are then coated with a corrosion and wear resistance material. *See*, claim 1. However, such heat treatment is not heat treating the devolatilizer nozzle (*e.g.*, the plate is not a devolatilizer nozzle as claimed) and there is no teaching or suggestion that such heat treatment improves the tensile strength and or yield strength of the devolatilizer nozzle, as claimed. In particular, ‘878 teaches work hardening the stainless steel material and heat treating the material for surface precipitation, not heat treating to harden the stainless steel material. *See*, paragraphs 3-4. In fact, portions of

'878 teach that heat treatment may actually reduce the hardness of the stainless steel material. *See*, paragraph 15 and examples.

Accordingly, reversal of the rejection is respectfully requested.

**II. THE EXAMINER ERRED IN REJECTING CLAIMS 4-15, 19-21, 23-25, 29-40 AND 44-49 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER '878.**

The Examiner states that "'878 teaches the invention cited above with the exception of specifically disclosing the...claimed sizes of holes". *See*, Final Office Action at page 3, lines 17-19. Applicants distinguished '878 from the pending claims in the above discussion and believe that repeating such arguments is unnecessary. However, the Examiner further states that "[a]t the time of the invention, it would have been an obvious matter of design choice to a person of ordinary skill in the art, to have used the claimed yield and tensile strength, the claimed sizes of holes and the thickness of the plate because applicant has not disclosed that claimed yield and tensile strength, the claimed sizes of holes, and the thickness of the plate provides an advantage, is used for a particular purpose, or solves a stated problem." *See*, Final Office Action at page 3, line 19 to page 4, line 4. Appellants disagree. As stated in the Summary of Claimed Subject Matter above, the claimed hole size, along with the increased strength as a result of heat treatment provides advantages (particularly increased devolatilization rates with manufacturing processability) and solves a stated problem (particularly, the inability to perforate hard materials to the recited and claimed size). As stated previously, initially high strength materials (*i.e.*, high strength materials prior to heat treatment) are not able to withstand the machining process to form small perforations and generally result in devolatilizer nozzles with deficiencies, such as brittleness.

The Examiner further states that "applicant did not traverse the examiner's assertion of Official Notice that using the claimed yield and tensile strength, the claimed sizes of holes, and the thickness of the plate are well-known in the art, such assertion is taken to be admitted prior art." *See*, Final Office Action at page 4, lines 11-17. Appellants have traversed the Examiner's assertion on numerous occasion and have made no admission as to the claimed yield strength, tensile strength, hole size, thickness of

plate and steel composition. *See*, at least Response to Office Action dated May 16, 2007. The Examiner did state that “[i]n response to applicant’s traversal of the APA, the ‘Examiner requests the Applicant to clarify what parts of the Applicant’s disclosure...are considered as applicants’ invention and what parts are well-known in the art.’” *See*, Final Office Action at page 9, lines 12-15. Appellants have clarified such herein. *See*, Summary of Claimed Subject Matter. Therefore, Applicants respectfully request reversal of the rejection.

**III. THE EXAMINER ERRED IN REJECTING CLAIM 22 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER ‘878 IN VIEW OF *NAKAGAWA*.**

The Examiner states that “‘878 teaches the invention cited above with the exception of annealing the steal plate.” *See*, Final Office Action at page 5, lines 5-6. The Examiner further states that “[i]t would have been obvious to one of ordinary skill in the art, at the time of the invention...in light of the teachings of Nakagawa et al., in order to strengthen the steel material prior to further processing operations.” *See*, Final Office Action at page 5, lines 7-10. Appellants disagree that it would have been obvious to strengthen the steel material prior to further processing operations. As discussed in the specification, solely strengthening the steel material would not have provided the processing benefits experienced by the present invention. Accordingly, even if the teachings of *Nakagawa* were combined with the teachings of ‘878, such combination does not teach, show or suggest the features recited in the pending claims.

Appellants distinguished ‘878 from the pending claims in the above discussion and believe that repeating such arguments is unnecessary. It is believed that the secondary references are no more pertinent to the Appellants’ disclosure than the primary references cited in the Office Action. Therefore, it is believed that a detailed discussion of the secondary references is not deemed necessary for a full and complete response to this Office Action. Based on such previously presented arguments, Appellants respectfully request reversal of the rejection.

**IV. THE EXAMINER ERRED IN REJECTING CLAIMS 1-21 AND 23-51 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER *APA* IN VIEW OF '878.**

As argued above, Appellants have traversed the Examiner's assertion on numerous occasion and have made no admission as to the claimed yield strength, tensile strength, hole size, thickness of plate and steel composition. Appellants distinguished '878 from the pending claims in the above discussion and believe that repeating such arguments is unnecessary. Based on such previously presented arguments, Appellants respectfully request reversal of the rejection.

**V. THE EXAMINER ERRED IN REJECTING CLAIM 22 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER *APA* IN VIEW OF '878 AND *NAKAGAWA*.**

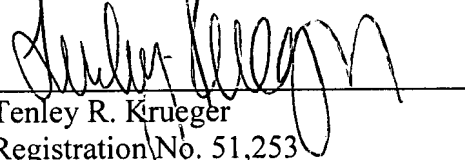
As set forth above, Appellants have traversed the Examiner's assertion on numerous occasion and have made no admission as to the claimed yield strength, tensile strength, hole size, thickness of plate and steel composition. Appellants distinguished '878 from the pending claims in the above discussion and believe that repeating such arguments is unnecessary. Based on such previously presented arguments, Appellants respectfully request reversal of the rejection.



### Conclusion

In conclusion, the references of record, either alone or in combination, nowhere teach, show or suggest forming a devolatilizer nozzle, as recited in the pending claims. Thus, Appellants respectfully request reversal of the rejections of claims 1-51.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Tenley R. Krueger", is written over a horizontal line.

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**Appendix A**  
***Pending Claims***

1. A method comprising:  
perforating a steel plate;  
forming a devolatilizer nozzle from said steel plate;  
heat treating said devolatilizer nozzle; and  
passing a volatile component through the perforations in the devolatilizer nozzle.
2. The method of Claim 1 wherein said heat treating increases the yield strength of said devolatilizer nozzle.
3. The method of Claim 1 wherein said heat treating increases the tensile strength of said devolatilizer nozzle.
4. The method of Claim 1 wherein said devolatilizer nozzle has a yield strength of at least about 110 ksi.
5. The method of Claim 1 wherein said devolatilizer nozzle has a yield strength of at least about 200 ksi.
6. The method of Claim 1 wherein said devolatilizer nozzle has a yield strength of at least about 270 ksi.
7. The method of Claim 1 wherein said devolatilizer nozzle has a tensile strength of at least 140 ksi.
8. The method of Claim 1 wherein said devolatilizer nozzle has a tensile strength of at least 210 ksi.
9. The method of Claim 1 wherein said devolatilizer nozzle has a tensile strength of at least 290 ksi.

10. The method of Claim 1 wherein said perforations comprise holes of no more than about 0.01 inches in diameter.
11. The method of Claim 1 wherein said perforations comprise holes of no more than about 0.03 inches in diameter.
12. The method of Claim 1 wherein said perforations comprise holes of no more than about 0.05 inches in diameter.
13. The method of Claim 1 wherein the thickness of said steel plate is from about 0 to about 0.75 inches.
14. The method of Claim 1 wherein the thickness of said steel plate is no more than about 0.4 inches.
15. The method of Claim 1 wherein the thickness of said steel plate is no more than about 0.25 inches.
16. The method of Claim 1 wherein said devolatilizer nozzle comprises at least about 500,000 perforations.
17. The method of Claim 1 wherein said devolatilizer nozzle comprises at least about 1,000,000 perforations.
18. The method of Claim 1 wherein said devolatilizer nozzle comprises at least about 1,500,000 perforations.
19. The method of Claim 12 wherein said devolatilizer nozzle comprises a center-to-center hole distance of at least about 0.08 inches.

20. The method of Claim 12 wherein said devolatilizer nozzle comprises a center-to-center hole distance of at least about 0.13 inches.
21. The method of Claim 12 wherein said devolatilizer nozzle comprises a center-to-center hole distance of at least about 0.18 inches.
22. The method of Claim 1 further comprising annealing said steel plate prior to forming a devolatilizer nozzle.
23. The method of Claim 1 wherein said steel plate comprises 420 stainless steel.
24. The method of Claim 1 wherein said steel plate comprises 420F stainless steel.
25. The method of Claim 1 wherein said steel plate comprises 440A stainless steel.
26. The method of Claim 1 wherein the capacity of said devolatilizer nozzle is from about 0 to about 75,000 pounds per hour.
27. The method of Claim 1 wherein the capacity of said devolatilizer nozzle is from about 20,000 to about 50,000 pounds per hour.
28. A devolatilizer nozzle comprising a heat treated and perforated steel plate.
29. The nozzle of Claim 28 wherein said devolatilizer nozzle has a yield strength of at least about 110 ksi.
30. The nozzle of Claim 28 wherein said devolatilizer nozzle has a yield strength of at least about 200 ksi.
31. The nozzle of Claim 28 wherein said devolatilizer nozzle has a yield strength of at least about 270 ksi.

32. The nozzle of Claim 28 wherein said devolatilizer nozzle has a tensile strength of at least 140 ksi.

33. The nozzle of Claim 28 wherein said devolatilizer nozzle has a tensile strength of at least 210 ksi.

34. The nozzle of Claim 28 wherein said devolatilizer nozzle has a tensile strength of at least 290 ksi.

35. The nozzle of Claim 28 wherein said perforations comprise holes of no more than about 0.01 inches in diameter.

36. The nozzle of Claim 28 wherein said perforations comprise holes of no more than about 0.03 inches in diameter.

37. The nozzle of Claim 28 wherein said perforations comprise holes of no more than about 0.05 inches in diameter.

38. The nozzle of Claim 28 wherein the thickness of said steel plate is from about 0 to about 0.75 inches.

39. The nozzle of Claim 28 wherein the thickness of said steel plate is no more than about 0.4 inches.

40. The nozzle of Claim 28 wherein the thickness of said steel plate is no more than about 0.25 inches.

41. The nozzle of Claim 28 wherein said devolatilizer nozzle comprises at least about 500,000 perforations.

42. The nozzle of Claim 28 wherein said devolatilizer nozzle comprises at least about 1,000,000 perforations.
43. The nozzle of Claim 28 wherein said devolatilizer nozzle comprises at least about 1,500,000 perforations.
44. The nozzle of Claim 37 wherein said devolatilizer nozzle comprises a center-to-center hole distance of at least about 0.08 inches.
45. The nozzle of Claim 37 wherein said devolatilizer nozzle comprises a center-to-center hole distance of at least about 0.13 inches.
46. The nozzle of Claim 37 wherein said devolatilizer nozzle comprises a center-to-center hole distance of at least about 0.18 inches.
47. The nozzle of Claim 28 wherein said steel plate comprises 420 stainless steel.
48. The nozzle of Claim 28 wherein said steel plate comprises 420F stainless steel.
49. The nozzle of Claim 28 wherein said steel plate comprises 440A stainless steel.
50. The nozzle of Claim 28 wherein the capacity of said devolatilizer nozzle is from about 0 to about 75,000 pounds per hour.
51. The nozzle of Claim 28 wherein the capacity of said devolatilizer nozzle is from about 20,000 to about 50,000 pounds per hour.

**Appendix B**  
*Evidence*

Not Applicable

**Appendix C**  
***Related Proceedings***

Not Applicable